Assiut University
Faculty of Science
Department of Geology

جامعة أسيوط
كلية العلوم
قسم الجيولوجيا

2022/2023 Second Semester, Final Examination

On: Earthquake Seismology and Seismic Prospection (G-350) Time: 2 hours

Answer the following questions:

First Question: Choose the correct answer: **(35 marks; one mark each)**

1. **_____ refers to the estimation of seismic hazard and risk, as well as the construction of aseismic buildings.**
   a) Observational Seismology
   b) Physical Seismology
   c) Engineering Seismology
   d) Explorational Seismology

2. **Which of the following describes the buildup and release of stress during an earthquake?**
   a) the Modified Mercalli Scale
   b) the elastic rebound theory
   c) the principle of superposition
   d) the travel time difference

3. **Which of the following can trigger a tsunami?**
   a) undersea earthquakes
   b) undersea landslides
   c) the eruption of an oceanic volcano
   d) all of these

4. **Which of the following statements best describes the state of earthquake prediction?**
   a) scientists can accurately predict the time and location of almost all earthquakes
   b) scientists can accurately predict the time and location of about 50% of all earthquakes
   c) scientists can accurately predict when an earthquake will occur, but not where
   d) scientists can characterize the seismic risk of an area, but can not yet accurately predict most earthquakes

5. **Which of the following sequences correctly lists the different seismic wave arrivals from first to last?**
   a) P-waves ... S-waves .... Surface waves
   b) Surface waves ... P-waves .... S-waves
   c) P-waves ... Surface waves ... S-waves
   d) S-waves ... P-waves .... Surface waves

6. **Which of the following can be triggered by an earthquake?**
   a) tsunami
   b) intense ground shaking
   c) a landslide
   d) all of these

7. **There are three types of boundaries: _____ where plates move apart from each other, _____ where plates move toward each other, and _____ where plates slide alongside each other.**
   a) divergent…convergent…transform
   b) transform…divergent…convergent
   c) convergent…transform…divergent
   d) divergent...transform...convergent

8. **Earthquake A has a Richter magnitude of 7.0 as compared with earthquake B's 6. The amount of ground motion is one measure of earthquake intensity.**
   a) A is 10X more intense than B
   b) A is 1000 more intense than B
   c) B is 0.01X as intense than A
   d) A is 100 more intense than B

9. **The boundary between the crust and the mantle is mostly chemical. This boundary is referred to as the _____**
   a) Gutenberg discontinuity
   b) Lehman discontinuity
   c) Mohorovičić discontinuity
   d) None of them

10. **We record ground shaking with an instrument called a _____, and the instrument makes a recording on a device called a _____ mostly these days with digital computers. The recording itself is called a _____.**
    a) seismometer...seismograph...seismogram b) seismograph...seismogram...seismometer
    c) seismogram...seismometer...seismograph d) seismometer...seismogram...seismograph

11. **There are many different types of earthquakes. The most common are _____. These occur when rocks in the Earth's crust break due to geological forces.**
    a) tectonic earthquakes b) volcanic earthquakes
    c) collapse earthquakes d) explosion earthquakes

12. **An example of how local soil conditions can greatly influence local intensity is given by catastrophic damage of _____.**
    a) 1981 (M 5.3) Aswan earthquake b) 1995 (M 6.9) Kobe (Japan) earthquake
    c) 1985 (M 8.1) Mexico City earthquake d) 2004 (M 9.1) Sumatra earthquake

13. **Why do some people die in some earthquakes more than others? Because of:**
    a) the power (magnitude) of the earthquake b) the level of development of the country
    c) the population density d) all of them

14. **Although _____ was the strongest one in Egypt, it was _____ that left the deepest imprint on everyone.**
    a) the 1995 (M 7.2) Gulf of Aqaba earthquake … the 1992 (M 5.9) Cairo event
    b) the 1995 (M 5.9) Gulf of Aqaba earthquake … the 1992 (M 7.2) Cairo event
    c) the 1969 (M 6.9) Shedwan earthquake … the 1992 (M 5.9) Gulf of Aqaba event
    d) The 1981 (M 5.3) Aswan earthquake … the 1995 (M 6.9) Shedwan event

15. **All the following are types of seismic waves, except:**
    a) Rayleigh wave b) Love wave c) Front wave d) P-wave

16. **How do rock particles move during the passage of an S-wave through the rock?**
    a) perpendicular to the direction of wave travel
    b) back and forth parallel to the direction of wave travel
    c) in a rolling elliptical motion
    d) in a rolling circular motion

17. **At convergent plate boundaries where oceanic and continental crust meet:**
    a) no associated volcanism occurs b) oceanic crust is subducted
    c) continental crust is subducted d) oceanic crust is created

18. **Long-term forecasting of earthquakes is based mainly on the knowledge of when and where earthquakes have occurred in the past. It may include:**
    a) paleoseismological evidence b) development of seismic hazard maps
    c) identification of seismic gaps d) all of them

19. **An earthquake will send out P-waves over the entire Globe, except for an area _____ of arc from the earthquake. This is called the P-wave shadow zone.**
    a) between 103° and 124° b) between 103° and 142°
    c) between 124° and 130° d) between 130° and 142°

20. **A certain limiting value of stress is known as:**
    a) Reflection strength b) Refraction strength
    c) Seismic strength d) Yield strength

21. **A 7.2 earthquake releases about _____ more energy than a 6.2 earthquake.**
    a) 23 times b) 32 times c) 10 times d) 2 times

22. **The total energy of the transmitted and reflected rays must equal to:**
    a) potential energy of a wave
    b) kinetic energy
    c) incident ray energy
    d) hydrocarbon energy

23. **The main requirements of the seismic source are:**
    a) The source waveform must be repeatable
    b) Energy must be safe and practical
    c) Sufficient energy only at the location
    d) Use as much energy as possible

24. **The reflection coefficient (R) is a numerical measure of the effect of an interface on wave propagation, and is calculated as the ratio of the:**
    a) Amplitude A1 of the incident ray to the amplitude A0 of the reflected ray
    b) Amplitude A1 of the reflected ray to the amplitude A0 of the incident ray
    c) Amplitude A0 of the incident ray to the amplitude A1 of the reflected ray
    d) Amplitude A0 of the reflected ray to the amplitude A0 of the incident ray

25. **The shear modulus measures:**
    a) The resistance to change in volume of a liquid
    b) The resistance to the flow of a liquid
    c) The resistance to change in volume of a solid
    d) The resistance to change in shape

26. **How often do magnitude 8.0 earthquakes occur?**
    a) about 5 to 10 times per year
    b) about once a year
    c) about every 5 to 10 years
    d) about every 50 to 100 years

27. **The response caught from the ground is measured by a sensor in seismic land surveys called:**
    a) Barometer
    b) Voltmeter
    c) Geophone
    d) Hydrophone

28. **The _____ is the ratio of the amplitude A2 of the transmitted ray to the amplitude A0 of the incident ray.**
    a) reflection coefficient (R)
    b) acoustic impedance (z)
    c) transmission coefficient (T)
    d) Poisson's ratio

29. **In the _____, the detectors are laid out in a line that does not pass through the shot point.**
    a) longitudinal profile
    b) non-longitudinal profile
    c) arc profile
    d) none of them

30. **In refraction seismic, the _____ is the wave that strikes a boundary between one seismic medium and another at a higher seismic velocity at the critical angle and is refracted by the perpendicular at a right angle.**
    a) reflected wave
    b) sound wave
    c) surface wave
    d) head wave

31. **_____ is a measure of the ability of a material to withstand changes in length when under lengthwise tension or compression.**
    a) Young's modulus
    b) Shear modulus
    c) Bulk modulus
    d) Poisson's ratio

32. **A _____ is a localized region within which the sudden release of energy leads to a rapid stressing of the surrounding medium.**
    a) seismograph
    b) spread
    c) seismic source
    d) geophone

33. **What parameters are seen from the seismic survey method?**
    a) Time characteristics
    b) Rock structure
    c) Density of the rocks
    d) Rock type

34. **All the following are land seismic sources except _____**
    a) weight dropped from a truck
    b) nuclear explosion tests
    c) vibroseis
    d) airguns

35. **Which of the following statements is false?**
   a) Most earthquakes occur at plate boundaries
   b) The time and location of most major earthquakes can be predicted several days in advance
   c) Earthquakes can be caused by normal, reverse, and strike-slip faulting
   d) P-waves travel faster than both S-waves and Surface waves

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Second Question: True or False: **(15 marks; one mark each)**

36. The effect of an earthquake on the Earth's surface is called the magnitude. Its scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally destruction. ( )

37. Surface waves arrive at the seismograph after body waves, it is surface waves that are almost entirely responsible for the damage and destruction associated with earthquakes. ( )

38. Scientists use triangulation to find the epicenter of an earthquake. When seismic data is collected from at least three different locations, it can be used to determine the epicenter by where it intersects. ( )

39. Vibroseis is the most common non-explosive source used for reflection surveying. It uses truck-mounted vibrators to pass into the ground an extended vibration of low amplitude and continuously varying frequency. ( )

40. Reflection events terminate sharply as the point of reflection reaches the fault plane and resumes in displaced portions on the other side of the fault. ( )

41. At convergent plate boundaries, plates slide horizontally against each other, neither creating nor destroying the lithosphere. However, at these boundaries, powerful earthquakes can occur. ( )

42. A horizontal gas-oil, gas-water, or oil-water contact produces a distinct reflection, especially where the reservoir is thick; such a reflection is called a bright spot hydrocarbon indicator. ( )

43. In Egypt, the seismic record is mainly divided into two main periods: the historical period (before the year 1900), and the instrumental one (from 1900 until the present). ( )

44. A hidden layer in seismic refraction is a layer whose presence remains undetected by because it is too thin or it is of lower velocity than the overlying medium. ( )

45. The collection of seismic traces that correspond to a particular midpoint is called a Common Midpoint (CMP) gathering. ( )

46. The S-wave shadow zone is the area of the Earth's surface where S-waves are not detected following an earthquake. This shadow zone has led geologists to a model of the Earth with a liquid mantle and a solid core. ( )

47. Recording of earthquakes in Egypt started as early as 1899 with the establishment of the Helwan Observatory in Cairo. ( )

48. Snell's law states that, for a given pair of media, the ratio of the sines of the angle of incidence θ1 and angle of refraction θ2 is equal to the ratio of phase velocities (V1 / V2) in the two media, or equivalently, to the refractive indices of the two media. ( )

49. Active geophysical methods are those that detect variations within the natural fields associated with the Earth, such as the gravitational and magnetic fields. ( )

50. Poisson's ratio is defined as the ratio of the change in the width per unit width of a material, to the change in its length per unit length, as a result of strain. ( )

Third Question: True or False: (Oral) **(10 marks; one mark each)**

51. The term "seismicity" is used to describe the geographic distribution of earthquakes and their characteristics such as their foci, magnitudes, occurrences over time, mechanisms, and the damage produced by them. ( )

52. Since there are an equal number of receivers on each side of the spread it is an off-end spread. ( )

53. Reconnaissance surveys tend to have coarser station intervals to cover a large area quickly and to indicate zones over which a more detailed survey should be conducted. ( )

54. Fold or multiplicity is the number of times that the same midpoint is sampled by different shots and different receivers. ( )

55. For a horizontal reflector, the reflection point is halfway from the source point to the receiver. For straight rays, the angle of incidence is about 35°. But the angle of incidence for real earth is approximately 28°. ( )

56. The chief sources of instrumental earthquake data in Egypt are inscriptions, papyri, paintings, diaries, diplomatic records, and archeological evidence provided by temples and monuments. ( )

57. The subducting plates generate powerful earthquakes (sometimes very deep earthquakes up to 700 km) and usually create a line of volcanoes along the overriding plate boundary. ( )

58. Vertical slices may be taken through the seismic data volume to display the pattern of reflections intersected by any time plane. Such a representation of the 3-D data is known as a time slice or seiscrop. ( )

59. The graph of the travel time of reflected rays (single horizontal reflector) plotted against offset distance on the time-distance curve is a hyperbola whose axis of symmetry is the time axis. ( )

60. Seismic Refraction Tomography (SRT) uses P- or S-wave travel times to map vertical and lateral changes in the subsurface. ( )

Good Luck,,, ***Assoc. Prof. Rashad Sawires***

Prof. Dr. Gamal Zidan Abdelaal

Assiut University
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Date: June 2023
Time allowed: 2 hours

Final Exam

Electrical Prospection (G 358), Total 50 Marks

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A) Mark the following statements with True (√) or False (X): (25 marks, one mark each)

No	Statement	TRUE (√)	FALSE (X)
1	Induced polarization method is extensively used for the exploration of disseminated metal-based minerals		
2	DC resistivity method depends on the storage of current whereas the induced polarization method depends on the flow of current		
3	Electrode polarization is smaller in magnitude than normal or background IP effect		
4	Membrane polarization is largest when a rock contains clay materials scattered through the matrix		
5	Surface area is the most important factor controlling the IP effect		
6	Chargeability is defined as the ability of the subsurface to flow charges		
7	IP measurements can be made in time domain or frequency domain		
8	IP method can be used to map lithologic variations in the subsurface		
9	The GPR method is best suited for the archaeological investigation		
10	The frequency of the GPR pulse energy ranges typically from 10 MHz to several thousand MHz		
11	The dielectric permittivity is defined as the ability of material to store EM energy in the form of induced charge polarization		
12	In GPR the attenuation of EM energy is primarily controlled by the electrical conductivity of the subsurface		
13	The EM wave velocities in GPR can be estimated from the dielectric constant of the subsurface		
14	The depth to target in GPR can be determined if the propagation velocity of the electromagnetic energy (Vm) through the material is known		
15	In GPR, the lower the frequency, the higher depth of penetration and higher resolution		
16	There is a trade-off between a penetration depth and resolution in GPR method		
17	In GPR, the vertical resolution is a measure of the ability to recognize individual, closely spaced reflectors		

18	In GPR, the larger the Fresnel zone, the lower the horizontal resolution .		
19	GPR method can be used in urban and forensic applications		
20	The electromagnetic (EM) techniques can be classified as time domain or frequency domain systems		
21	The main disadvantage of the EM methods is that they require direct contact with the ground		
22	In EM method, a secondary EM field is produced if a subsurface resistive anomaly is present		
23	The EM systems are passive only		
24	The skin depth in EM method is the depth at which the amplitude of a plane wave has decreased to 1/e relative to its initial amplitude		
25	VLF method is very effective in locating subsurface zones of high electrical conductivity		

B) Choose the correct answer of the following: - (25 marks, one mark each)

26) The induced polarization method is classified as:

a) surface method
b) active method
c) electrical method
d) all of the above

27) The induced polarization method depends on the:

a) flow of current in the subsurface
b) storage of current
c) both flow and storage
d) none of the above

28) The IP method is a primary tool to explore:

a) porphyry cuppers deposits
b) bedded lead-zinc deposits
c) sulphide related gold deposits
d) all of the above

29) The largest IP effect associated with the source of:

a) membrane polarization
b) electrode polarization
c) ion selective membrane polarization
d) electrolytic polarization

30) The electric double layer at the mineral-fluid interface consists of:

a) adsorbed layer
b) diffusive layer
c) hidden layer
d) a and b

31) The IP effect is controlled by:

a) ionic mobility
b) surface area
c) surface charge density
d) all of the above

32) The IP method is effective in mapping the subsurface lithology because it is very sensitive to changes in:

a) surface area
b) surface charge density
c) ionic mobility
d) none of the above

33) In the IP method, the increase in pore fluid chemistry will result in:
- a) general decrease in IP magnitude
- b) general increase in IP magnitude
- c) decrease and then increase in IP magnitude
- d) increase and then decrease in IP magnitude

34) IP measurements can be performed in the:
- a) time domain
- b) space domain
- c) frequency domain
- d) a and c

35) The unit of chargeability for IP measurements is:
- a) m/sec
- b) ohm.m
- c) siemens/m
- d) mSec

36) The IP phenomenon develops when the induced current:
- a) switched on
- b) switched off
- c) a and b
- d) none of the above

37) The IP method can be used to map:
- a) disseminated metallic minerals
- b) lithology
- c) salt-water intrusion
- d) all of the above

38) In the IP method, the subsurface earth materials act as:
- a) capacitor
- b) conductor
- c) insulator
- d) none of the above

39) Which of the following is controlling the propagation of EM waves in GPR survey:
- a) dielectric permittivity of the subsurface
- b) electrical conductivity of the subsurface
- c) magnetic permeability of the subsurface
- d) all of the above

40) Which of the following parameters has major effect in the attenuation of EM waves in GPR survey:
- a) dielectric permittivity of the subsurface
- b) electrical conductivity of the subsurface
- c) magnetic permeability of the subsurface
- d) all of the above

41) The propagation velocity of EM waves in GPR survey can be estimated from:
- a) dielectric permittivity of the subsurface
- b) electrical conductivity of the subsurface
- c) density of the subsurface
- d) magnetic permeability of the subsurface

42) In GPR survey, high frequency antenna will result in:
- a) greater penetration depth and lower resolution
- b) lower penetration depth and higher resolution
- c) lower penetration depth and lower resolution
- d) greater penetration depth and higher resolution

43) As a rule of thumb, the vertical resolution in GPR method is equal to:
- a) 1/2 the wavelength of the EM wave
- b) 1/4 the wavelength of the EM wave
- c) 1/3 the wavelength of the EM wave
- d) 1/10 the wavelength of the EM wave

44) If the target in GPR is much smaller than the footprint size then:
- a) the target will not be imaged
- b) the target will be highly imaged
- c) part of the target will be imaged
- d) all of the above

45) The survey mode of GPR in boreholes is called:
- a) continuous profiling mode
- b) common midpoint mode
- c) transillumination mode
- d) sounding mode

46) Which of the following methods can be used to estimate depth from GPR records:
- a) from relative dielectric permittivity
- b) shoot to target of known depth
- c) hyperbola fitting
- d) all of the above

47) The GPR method can be applied in:
- a) forensic applications
- b) urban applications
- c) hdrogeophysical applications
- d) all of the above

48) Electromagnetic methods usually use low frequency EM waves where:
- a) conduction currents predominate
- b) displacement currents predominate
- c) a and b
- d) none of the above

49) The EM systems can be classified as:
- a) time vs frequency domains
- b) active vs passive
- c) a and b
- d) none of the above

50) VLF detects electrical conductors by utilizing radio signal in the range of:
- a) 15 to 30 Hz
- b) 15 to 30 KHz
- c) 15 to 30 MHz
- d) 15 to 30 GHz

==========End of Questions==========

جامعة أسيوط
كلية العلوم - قسم الجيولوجيا

بسم الله الرحمن الرحيم

امتحان الفرقة الثالثة بكلية العلوم شعبة الجيولوجيا

المادة: الحفريات الدقيقة والجيولوجيا التاريخية (315ج)
(315G) (Micropaleontology and Historical Geology)

الفصل الدراسى الثانى 2023م الدرجة: 50 درجة الزمن: ثلاث ساعات

أجب عن الأسئلة التالية
ملحوظه: الاختبار يتكون من 6 صفحات

السؤال الأول: (5 درجات)

- Discuss the different marine environments of the foraminifera.

السؤال الثانى :(5 درجات)

- Compare between the Radiolaria and Ostracoda in:
A- Systematic position B- environmental habitat C- shell walls
D– shell shape E- mode of life

السؤال الثالث: (5 درجات)

Choice the correct answer

1- Which part of the conodonta has been preserved?
A- Teeth B- Bones C- Skull D- Limbs

2- Which of the following is NOT correct for the index fossil?
A- abundant B-distinctive
C- found in certain type of rocks D- short geologic age

3- Conodonts are .....
A- an extinct group of fish
B- an extinct group of Sponges
C- an extinct Chordates that are very useful index fossils
D- the earliest group of Chordates know from the fossil record

4- Which of the following statements is true?

A- Shell of microfossils usually contain organic as well as inorganic materials.

B- Jellyfish can become fossils as their body contains hard parts.

C- Every organism that dies becomes a fossil.

D- None of these

5- The wall structure of benthonic foraminifera is made of .....

A- agglutinated B- calcareous.

C- siliceous D- all of these

6- Which of the following is NOT a member of protozoa?

A- Ostracoda B- Radiolaria

C- Nannoplankton D- Foraminifera

7- The marine depth which receives non-sufficient light for photosynthesis is known by .....

A- Dysphotic B- photic

C- aphotic D- light zone

8- Which of the following is NOT true for the Planktonic foraminifera?

A- Paleo-environmental indicator

B- Paleo-pathymetery indicator

C- Paleo-oceanography indicator

D- Paleo-climte indicator

9- Normal sea water is characterized by .....water.

A- alkaline B- acidic

C- neutral D- all of these

10- What is Micropaleontology the study of?

A- The study of all microscopic fossils

B- The study of foraminifera fauna

C-The study of diatoms algae

D- All of these

السؤال الرابع: (5 درجات)

Mark the correct and the wrong statements, and correct the wrong one:

A- Proximal face is that part of a palynomorph, which faces towards the centre of the tetrad, between equator and proximal pole.

B- Maceration (oxidation) is one of the essential steps in the standard palynological processing technique.

C- Dinoflagellates with a nucleus are classified under Dinokaryota.

D- For classifying dinoflagellate cysts, number and arrangement of plates are very important criteria.

E- Potonié's turmal classification of spores and pollen grains is regarded as an artificial (i.e. non-biological) classification.

F. In a pollen tetrad, aperture is located at the proximal face.

G- Fossil spore and pollen grains share more or less the same morphological features except that of wall structure, type & position of aperture.

H. New and inexperienced HF users should be monitored by experienced laboratory personnel.

I. Dinoflagellates are classified using the International Code of Zoological Nomenclature (ICZN) as protozoans.

J. Treatment of clay samples using sodium hexametaphosphate [(NaPO3)6] provides more palynologically-productive residue than the acid treatment.

السؤال الخامس: (5 درجات)

Define Five only of the following:

A- Tabulation, B- Aperture, C- Exine, D- Spores, E- Archeopyle, F- Amb, G- Cingulum.

السؤال السادس: (5 درجات)

Write briefly on Two only of the following:

A- Cingulum and cavation in wall of the dinoflagellate cysts (with drawings).

B- Life cycle of spore-producing plants (with drawings).

C- Standard palynological extraction technique of organic matter from sedimentary rocks.

السؤال السابع: (10 درجات)

Choice the correct answer

1- What is the correct order of the epochs of the Paleogene Period from earliest to latest?

A- Cretaceous, Jurassic, Triassic
B- Paleocene, Eocene, Oligocene
C- Oligocene, Miocene, Pliocene
D- Eocene, Cretaceous, Paleocene

2- The smallest formal unit of geologic time is .....

A- an eon B- a period
C- an era D- an epoch

3- The atmosphere formed as a result of .....

A- spontaneous generation B- evaporation
C- materials that fell on to Earth from space
D- the outpouring of gases from the interior of the Earth

4- Which of these organisms existed first on Earth?

A- angiosperms B- birds
C- cyanobacteria D- Amphibians

5- The longest geologic time of Earth's history was.....

A- Precambrian B- Paleozoic C- Neogene D- Mesozoic

6- Why is the Precambrian fossil record so sparse?

A- there were no living things. B- all organisms lived on land.
C- all the organisms had soft bodies. D- all of these.

7- During the Hadean Era of the Earth's history, ...

A- there was no life B- angiosperms evolved
C- there was life everywhere D- vertebrates evolved

8- Most periods in the geologic time scale are named for .....

A- geographic localities C- fossils
B- catastrophic events D- paleontologists

9- Tillite i22s formed from……..

A- lake sediments B- river sediments

C- marine sediments D- glacial deposits

10- Identity the correct sequence

A- Continental shelf-continental rise-continental slop-deep sea plains

B- Continental shelf-Continental slope-Continental rise-deep sea plains

C- Continental shelf-oceanic trench-Continental slope-Continental rise-deep sea plain

D-Continental rise-Continental shelf-Continental slope-deep sea plains

11- Fusilinids are the characteristic fossil of:

A- Devonian B- Carboniferous C- Triassic D- Cambrian

12- The largest supercontinent during the Permian period was known…

A- Pangaea B- Laurentia C- Gondwanaland D- Rodinia

13- The orogeny that was happened during the Late Silurian to the end of the Devonian is known as the

A- Acadian Orogeny B- Caledonian Orogeny

C- Appalachian Orogeny D- Urals Orogeny

14- The first form of vertebrate life on the Earth

A- Jawless Fish B- Armored Fish C- Cartilage Fish D- Bony Fish

15- Uppermost …….. rocks document an episode of widespread extinction and expansion of glaciers near the south pole that we know was related to that extinction.

A- Ordovician B- Cretaceous C- Cambrian D- Triassic

16- Greenhouse effect will lead to ……..

A- an increase in Oxygen Production B- greater rainfall

C- decrease in atmospheric pressure

D-an increase in the temperature

17- Younger organisms replace older organisms refers to……

A- Principle of Superposition B- Principle of Faunal Succession
C- Principle of Horizontality D- Principle of Faunal Succession

18- Radiometric age is often referred to as ..... age.
A- total B- absolute C- historic D- geologic

19- Upper Cretaceous rock layers correspond to.....
A- Late Cretaceous B- Middle Cretaceous
C- Early Cretaceous D- Earliest Cretaceous

20- The smallest formal unit of the Chronostratigraphy.
A- Peroid B- Stage C- Series D- Era

السؤال الثامن: (10 درجات)

1- Discuss the following sentences: (4 Marks)
A- Proterozoic climate B- The closure of Iapetus Ocean

2- Tabulate the rock-building fossils throughout the Paleozoic Era. (4 Marks)

3- Write the derivation of only two of the following: (2Marks)
A- Pliocene Epoch B- Proterozoic Era C- Cryptozoic Era

تمت الأسئلة مع التمنيات بالتوفيق

ا.د. ناجح عبدالرحمن عبيد اللة ا.د.عمرو سعيد ضيف

Geology Department Faculty of Science Assiut University		June, 2023 Time: 3H

Principles of Petrology (324G)

Final Exam (50 Marks)

Choose the correct answer from A, B, C and D:

1- ..... is the reaction of the magma with the country rocks, whereby these country rocks are incorporated in the magma and eventually melt.

A- Fractionation B- Assimilation C- Magma mixing D- all of them

2- Solid mantle rock can partially melt by pressure .....

A- increasing B- decreasing C- stable D- none of them

3- ..... are characterized by two sets of cleavages intersect at about 87^0 and 93^0.

A- Olivine B- Quartz C- Amphibole D- Pyroxene

4- Anorthosite is a phaneritic, intrusive igneous rock characterized by its composition mostly

A- plagioclase B- olivine C- pyroxene D- quartz

5- ..... is a plutonic igneous rock intermediate in composition between syenite and diorite.

A- Granodiorite B- Tonalite C- Monzonite D- none of them

6- ..... a texture wherein plagioclase grains show a preferred orientation due to flowage.

A- Intersertal B- Intergranular C- Trachytic D- Poikilitic

7- ..... a texture commonly found in glassy rhyolites.

A- Spherulitic B- Obicular C- Coronas D- all of them

8- ..... a texture in which the angular interstices between plagioclase grains are occupied by grains of ferromagnesium minerals such as olivine, pyroxene, or iron titanium oxides.

A- Granophyric B- Perthitic C- Intergranular D- all of them

9- ..... a basic mineral found essentially in the ultramafic-mafic rocks.

A- Quartz B- Rutile C- Gypsum D- none of them

10- Decompression melting of mantle is usually occurring in ..... zone.

A- rifting B- subduction C- plume D- none of them

11- ..... are single-chain silicates with the general formula $XYSi_2O_6$

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12- Amphiboles are present in almost all rocks; but they are more abundant in ..... rocks.

A- mafic B- felsic C- intermediate D- ultramafic

13- Syenite is a coarse-grained intrusive igneous rock essentially composed of .....

A- Quartz A- Plagioclase A- Olivine A- alkali feldspar

14- The main factor that determines the texture of an igneous rock is the .....

A- cooling rate B- diffusion rate C- nucleation rate D- growth rate

15- Metamorphism characterized by very high temperatures at very low pressures, generated by a volcanic or subvolcanic body.

A- Pyrometamorphism B- Burial C- Fault-Zone D- none of them

16- Which list of metamorphic facies is in order from lowest to highest grade?

A- Amphibolite, zeolite, greenschist, granulite B- Granulite, amphibolite, greenschist, zeolite

C- Greenschist, granulite, amphibolite, zeolite D- Zeolite, greenschist, amphibolite, granulite

17- ..... facies occurs in areas of low T/P gradients, characteristically developed in subduction zones

A- Blueschist B-Eclogite C- Sanidinite D- all of them

18- In ..... texture, the pyroxene grains partially or completely surround plagioclase laths; common texture of gabbros and basalts.

A- ophitic & subophitic B- intergranular C- intersertal D- none of them

19- ..... is a rock in the early stages of mylonitisation, containing more than 50% porphyroclasts.

A- Ultramylonite B- Phyllonite C- Protomylonite D- Mylonite

20- ..... Is a fine-grained, cohesive fault rock that generally forms at shallow depths in the crust, dominantly by brittle deformation processes.

A- Cataclasite B- Mylonite C- Fault breccia D- none of them

21- ..... is a metamorphic rock dominated by hornblende and plagioclase.

A- Amphibolite B- Greenstone C- Mylonite D- none of them

22- ..... a green and red metamorphic rock that contains clinopyroxene and garnet.

A- Greenstone B- Phyllonite C- Amphibolite D- none of them

23- ..... segregated into layers by metamorphic processes

A- Gneiss B- Schist C- Slate D- Mylonite

24- ..... compact, very fine-grained, metamorphic rock with a well-developed cleavage. Freshly cleaved surfaces are dull.

A- Slate B- Phyllite C- Schist D- Gneiss

25- ..... decreasing grade as rock cools and recovers from a metamorphic or igneous event

A- Prograde B- Retrograde C- Progressed D- none of them

26- ..... metamorphism occurs in areas that have not experienced significant deformation or orogeny.

A- Regional B- Ocean-Floor C- Burial D- all of them

27- ..... T/P geotherms in areas of plutonic activity or rifting.

A- Low B- High C- Moderate D- all of them

28- Migmatite commonly having a dark gneissic matrix and lighter felsic portions called .....

A- melanosome B- leucosome C- Skarn D- all of them

29- ..... Metamorphism when deviatoric stress is dominant and deformation + recrystallization is the main process.

A- Dynamo-thermal B- Dynamic C- Thermal D- all of them

30- ..... metamorphism typically occurs locally within regional terranes.

A- Contact B- Orogenic C- Ocean-Floor D- Retrograde

31- Rounding is.....

A. The grinding away of sharp edges and corners of rock fragments during transportation.
B. The relative sphericity of a grain.
C. Weathering of sharp edges and corners of bedrock exposed at Earth's surface.
D. All of these

32- A layer in which the grain size changes vertically through the layer is called.....

A- Foliated B- Cross-bedded. C- Graded bedding D- Is not observed in nature.

33- Features that form in a sedimentary rock at the time of deposition or immediately after are called.....

A. Sdimentary features. B. Sedimentary structures.
C. Geopetal structures. D. Horizontal bedding.

34- What is the difference between a breccia and a conglomerate?

A. Breccias are coarse grained and conglomerates are fine grained.
B. Conglomerates are coarse grained and breccias are fine grained.
C. Breccias have rounded fragments and conglomerates have angular fragments.
D. Breccias have angular fragments and conglomerates have rounded fragments.

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A. Increases. B. Decreases. C. Stays the same. D. None of them.

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A. Cross bedding. B. Lamination. C. Graded bedding. D. Mud cracks.

38. The tendency for variations in current velocity to segregate sediments on the basis of particle size is called.....

A. Lithification. B. Compaction. C. Metamorphism. D. Sorting.

39. The angularity of the edges and corners of grains in a sedimentary rock is referred to as

A. Roughness. B. Smoothness. C. Rounding. D. None of them.

40. Mud cracks are common in which type of sedimentary rocks?

A. Fine grained. B. Medium grained.
C. Coarse grained. D. Not particular.

41. Whether a sedimentary rock consists of a wide or a narrow range of grain sizes depends primarily on:

A. The shape of the grains. B. The mineralogy of the source rock.
C. The energy of the transporting agent. D. The latitude in which the sediment was deposited.

42. Which of the following is the most likely way for sandstone to form?

A. Precipitation of sediments from seawater that has been concentrated by evaporation.
B. Compaction and cementation of sediments that have been eroded from pre-existing rocks.
C. Secretion of calcium carbonate by shelled organisms and accumulation of these shells.
D. All the above.

43. Which one of the following features is NOT associated with sedimentary rocks?

A. Bedding. B. Foliation. C. Gradation. D. All of them.

44. Shale refers to a rock formed from.....

A. Sand sized material. B. Plant remains. C. Clay minerals. D. None of them.

45. The definition of a clastic sedimentary rock would read as.....

A. Composed of fragments of pre-existing rocks.
B. Composed of carbonate material precipitated in sea water.
C. Composed of carbonate material secreted by organisms.
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A. Greater than 1 mm. B. Lesser 1 mm.
C. Greater than 2 mm. D. Between 0.5 to 1.5mm.

47. The cement in sandstone is typically the result of the precipitation of minerals like quartz and calcite from.....

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48. Porosity in a sediment or sedimentary rock is a measure of.....

A. The percentage of water contained in the material.
B. The percentage of void space in the material.
C. The percentage of petroleum contained in the material.
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49. Sand sized particles have diameters in the range.....

A. > 256 mm. B. < 0.0039 mm.
C. 2 - 0.062 mm. D. None of them.

50. Breccia is formed by which process?

A. Mechanical. B. Chemical. C. Organic. D. Residual.

GOOD LUCK.....

Geology Department Faculty of Science Assiut University		June, 2023 Time: 3H

Principles of Petrology (324G)

Final Exam (50 Marks)

Choose the correct answer from A, B, C and D:

1- ..... is the reaction of the magma with the country rocks, whereby these country rocks are incorporated in the magma and eventually melt.

A- Fractionation B- Assimilation C- Magma mixing D- all of them

2- Solid mantle rock can partially melt by pressure .....

A- increasing B- decreasing C- stable D- none of them

3- ..... are characterized by two sets of cleavages intersect at about 87^{o} and 93^{o}.

A- Olivine B- Quartz C- Amphibole D- Pyroxene

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GOOD LUCK.....

جامعة أسيوط
كلية العلوم - قسم الجيولوجيا

بسم الله الرحمن الرحيم

امتحان التحريرى للمستوى الرابع بكلية العلوم شعب الجيولوجيا والجيوفيزياء والجيولوجيا كيمياء

المادة: جيولوجيا الحقل (306 ج)
Field Geology (306 G)

الفصل الدراسى الثانى 2022/2023م الدرجة: 20 درجة الزمن: ساعتان

ملحوظة: هذا الأمتحان مكمل لأمتحان اخر (اختيار متعدد) من 30 درجة يتم اجابته على نظام البابل شيت

Answer the following questions:

1- First Question **(8 Marks)**

- Write short notes on the structural types of lavas.

2- Second Question **(12 Marks)**

Compare between the following pairs:

A- Shear cleavage and fracture cleavage.

B- Cinder cones and stratovilcanoes.

C- Cumulate layering and massive layering.

With my best wishes
Prof. Dr. Aly A. Khoudier

Assiut University
Faculty of science
Geology Department

Date: June, 2023
Time allowed: 2 hours

Second semester final exam in metamorphic rocks (G336)
Students: 3rd year geology

Choose the correct answer A, B, C or D (one mark for each): (50 Marks)

1. *In regional metamorphism the source of increased temperature and pressure is _____*
   A- the increase in temperature with increasing depth of burial
   B- due to increased rate of radioactive decay
   C- a local intrusive heat source
   D- impact metamorphism
2. *Zeolite facies are associated with_____ metamorphism*
   A- Contact
   B- Buchan type
   C- Burial
   D- Barrovian type
3. *Silica phases may be found in _____*
   A-greenschist facies
   B - sanidinite facies
   C- eclogite facies
   D- amphipolite facies
4. *Marble is a metamorphic rock that forms from a _____ parent.*
   A- acidic igneous rocks *B- limestone* *C- sandstone* *D- shale*
5. *The pressure and heat that drive metamorphism result from which three forces?*
   A- The internal heat of the Earth, the weight of overlying rocks, and horizontal pressures developed as rocks become deformed
   B-The weight of the overlying rocks, solar heating, and nuclear fusion
   C- Horizontal pressures developed as rocks deform, bonding, heat released during crystallization
   D- Internal heat of the Earth, nuclear fission, heat released during chemical weathering
6. *What type of metamorphism is caused by high temperature and high pressure imposed over a large volume of crust?*
   A- burial *B- contact* *C- regional* *D- cataclastic*
7. *A geothermometer is?*
   A- a device that measures temperature in deep drill holes
   B- a device that measures current rock temperatures at the surface
   C- a mineral assemblage that can reveal the minimum temperature attained during heating
   D- the range of temperatures experienced by a rock during its geologic history
8. *During metamorphism, changes in the bulk composition of a rock occur primarily as a result of _____?*
   A- increases in pressure
   B- increases in temperature
   C- reaction with hydrothermal fluids
   D- all of these

9. *Which type of pressure will result in the alignment of metamorphic minerals?*
   A- contact pressure *B- directed pressure*
   C- confining pressure *D- chemical pressure*
10. *A rock that has undergone cataclastic metamorphism would most likely display which of the following?*
   A- preserved sedimentary layering *B- pulverized rock fragments*
   C- new minerals *D- large olivine crystals*
11. *Which of the following statements about metamorphism of a shale is false?*
   A- with increasing metamorphism, the clay minerals breakdown to form micas
   B- with increasing metamorphism, the grain size of the minerals gets smaller
   C- with increasing metamorphism, foliation develops
   D- with increasing metamorphism, the amount of water decreases
12. *Which of the following metamorphic rocks cannot form from a shale?*
   A- schist *B- marble* *C- hornfels* *D- slate*
13. *Which of the following metamorphic rocks is not paired with its true parent rock?*
   A- greenstone-basalt *B- quartzite - quartz arenite*
   C- schist – shale *D- hornfels - dolomite*
14. *Which of the following index minerals forms at the highest metamorphic grade?*
   A- chlorite *B- sillmanite* *C- biotite* *D- garnet*
15. *What is the pressure on a rock at 15 kilometers depth?*
   A- about 5 times atmospheric pressure
   B- about 50 times atmospheric pressure
   C- about 500 times atmospheric pressure
   D- about 5000 times atmospheric
16. *Which of the following processes will cause metamorphism?*
   A- a change in the chemical environment *B- an increase in temperature*
   C- an increase in pressure *D- all of these*
17. *The process where rocks previously metamorphosed under high-grade conditions are later metamorphosed under low-grade conditions is _____*
   A- metasomatism *B- cataclastic* *C- foliation* *D- retrograde metamorphism*
18. *Hydrothermal metamorphism is very common in which of the following settings?*
   A- at continental collision zones *B- along shallow faults*
   C- at mid-ocean ridges *D- in mid-continental regions*
19. *In which of the following metamorphic environments would you expect to find bedding and other sedimentary structures to be preserved.*
   A- burial metamorphism *B- along faults*
   C- contact metamorphism *D- regional metamorphism*
20. *Which of the following is not used to classify foliated rocks?*
   A- crystal size *B- the texture of the parent rock*
   C- the degree to which minerals are segregated into lighter and darker bands
   D- the metamorphic grade

21. *Which of the following sets is arranged in order of increasing metamorphic grade?*

A- shale - slate – phyllite *B- phyllite - gneiss – schist*

C- phyllite - slate – schist *D- schist - shale – gneiss*

22. *Which of the following rocks can be considered gradational between an igneous rock and a metamorphic rock?*

A- geniss *B- quartzite* *C- migmatite* *D- schist*

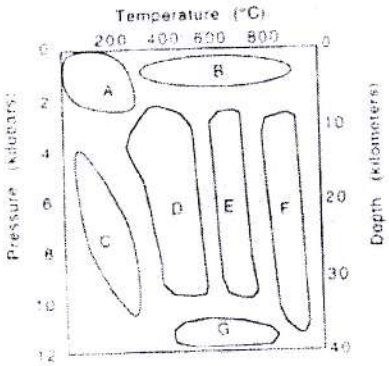
23. *Which of the following metamorphic rocks forms in the forearc of a subduction zone?*

A- amphibolite *B- blueschist* *C- quartzite* *D- gneiss*

24. *A rock rich in garnet and pyroxene that forms at extremely high pressures and moderate to high temperatures is called a(n)* _____

A- amphibolite *B- hornfels* *C- granulite* *D- eclogite*

25. *In the given figure, the contact facies occurs in which pressure-temperature regime?*



A- area A *B- area B* *C- area C* *D- area A*

26. *The blueschist facies occurs in which pressure-temperature regime?*

A- area C *B- area D* *C- area E* *D- area F*

27. *Changing of grain size during the process of metamorphism is classified as* _____

A- folding *B- bending* *C- recrystallization* *D- bedding*

28. *Which is not a metamorphic rock?*

A- basalt *B- quartzite* *C- slate* *D- hornfels*

29. *Which metamorphic rock is widely used in building construction?*

A- slate *B- hornfels* *C- marble* *D- (b and c)*

30. *Which list of metamorphic facies is in order from lowest to highest grade?*

A- Amphibolite, zeolite, greenschist, granulite

B- Granulite, amphibolite, greenschist, zeolite

C- Greenschist, granulite, amphibolite, zeolite

D- Zeolite, greenschist, amphibolite, granulite

31. A metamorphic facies is best defined as a group of rocks that:
   A- Formed at similar latitudes on different continents
   B- Were metamorphosed under similar pressure and temperature conditions
   C- Experienced contact metamorphism due to exposure to the same type of magma
   D- Had the same parent rock before experiencing different grades of metamorphism
32. Nonfoliated metamorphic rocks are typically associated with:
   A- Burial and contact metamorphism
   B- Regional and shock metamorphism
   C- Hydrothermal and burial metamorphism
   D- Contact and hydrothermal metamorphism
33. A geologist concludes that a particular metamorphic rock formed at high pressure. Which feature of the rock most likely led to this conclusion?
   A- It contains dense minerals
   B- Its parent rock contained large sediments
   C- Its layers have been pulled and lengthened
   D- It was found in close association with intrusive igneous
34. Sedimentary and metamorphic rocks can both be found on Earth's surface. Unlike sedimentary rocks, however, most metamorphic rocks:
   A- Form on or near Earth's surface
   B- Cannot be broken down to form sediment
   C- Contain minerals that are stable at Earth's surface
   D- Reach Earth's surface only through uplift of deeper rocks
35. If slate is exposed to more heat and pressure it changes into
   A- Phyllite B- Schist C- Gneiss D- Granite
36. Where are extensive area of metamorphic rocks found in Egypt?
   A- Eastern Desert B- Sinai C- Western Desert D- A and B
37. At distance ½D of basic intrusion, the temperature attends to
   A- 410+Tc B- 420+Tc C- 430+Tc D- 440+Tc
38. Which one of these minerals is a stress mineral?
   A-garnet B- cordierite C- muscovite D- andalusite
39. Possible temperature attained at contact of intermediate intrusion {1000m thickness}
   A- 560+Tc B- 550+Tc C- 510+Tc D- 460+Tc
40. Type of metamorphism that can cause the formation of porphyroclastic texture
   A-dynamic B-regional C- thermal D- metasomatic metamorphism
41. Which of these rocks are characterized by decussate texture?
   A- phyllite B-mylonite C-marble D-amphibolite

42. Granulite facies is well developed in _____
A-Precambrian terrains B-subduction zone
C-transform fault D-divergence zone

43. In which grade k-feldspar and muscovite are present?
A-very low B-medium C-high D-low grade

44. The metamorphic process happened at _____depth
A-10-30km B- 35-40km C- 50-60km D- 40-50km

45. The expected metamorphic grade at the contact of deep sea basic intrusion
A-low B- medium C- high D- very low grade

46. Possible mineral assemblage in schist are:
A- mica+quartz+garnet B- calcite+olivine+pyroxene
C-feldspar+quartz+amphibole+mica D- pyroxene+quatz+olivine

47. This facies is one of the very low-grade metamorphic rocks
A- greenschist facies B- lawsonite-glaucophane facies
C-amphibolite facies D-eclogite facies

48. The characteristic mineral in low-grade metamorphic rocks
A- pumpellyine B-prehnite C-ziosite D-staurolite

49. Andradite present in _____
A- thermally metamorphosed calcareous sediment
B- dynamic metamorphic sediments
C- regionally metamorphic sediments
D- metasomatic calcareous sediment

50. Slate sometimes to be a red due to _____
A-iron oxide B-chlorite C-clay minerals D-feldspars

امتحان الشفوي عقب امتحان النظري مباشرة (مكتب أ.د/ حسين عزيز محمد حجازي)
تمنياتى بالتوفيق والنجاح

جامعة أسيوط
كلية العلـــوم-قسم الجيولوجيا

امتحان طلاب المستوى الثالث (كيمياء وجيولوجيا)
مقرر (٣٤٥ ج) مبادئ الجيولوجيا التركيبية

الزمن : ٢ ساعة

٤ يونيو ٢٠٢٣م

PRINCIPALS OF STRUCTURAL GEOLOGY

(50 marks)

Try to illustrate your answers with suitable drawings when possible

ANSWER THE FOLLOWING QUESTIONS:

I- Choose the correct answer for the following statements *(5marks)*

1. **Forces acting on a rock of per unit area and consequence deformation is known as respectively:**
   a. Strain and stress
   b. Stress and tension
   c. Stress and compression
   d. Stress and strain

2. **In which unconformity older rocks are of plutonic origin:**
   a. Angular unconformity
   b. Non unconformity
   c. Disconformity
   d. Local unconformity

3. **Structures that result from the motion in sediments before they lithified into a rock; not a result of tectonic activity are known as…**
   a. Non-tectonic structures
   b. Deformational structures
   c. Primary structures
   d. Plastic deformations

4. **The angle which a fault plane makes with vertical plane and is considered complement of dip**
   a- Rake
   b- Throw
   c- Hade
   d- Heave

5. **An igneous intrusion that cuts across rock layers is called a…**
   a. Dike.
   b. Sill.
   c. Batholith.
   d. Laccolith.

II- True or False? (Circle the correct answer). *(5marks)*

6. The ability of the material to deform without breaking is called Plasticity. True or False?
7. Stress and strain are the same thing. True or False
8. Vertical faults have neither a footwall nor a hanging wall. True or False?
9. In an anticline, the hanging wall moves upward relative to the footwall. True or False
10. Folds result from brittle deformation of rocks. True or False?

III - Write short notes on TWO ONLY: *(14 marks)*

11. How do you recognize folds on field and geological maps?
12. The different types rock strains.
13. Non-Tectonic Structures.

III- Compare between TWO ONLY: *(14 marks)*

14. Dilation and distortion.

15. Different kinds of unconformities.

16. Parasitic folds and kink bands.

IV- Using the figures below and answer the following:

17. In the geologic map below, units A, B, C, D and E represent sedimentary beds. The thick dark line is fault *(6marks)*

a- Which of these beds is the oldest?

.....

b- Describe the of structure shown on the map?

.....

.....

c- Have you noticed unconformity? what are its types ?

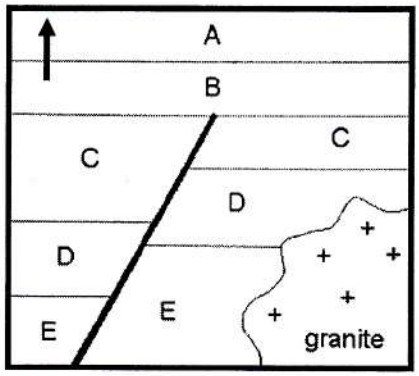
.....

.....

.....

d- Which rock is more recent, igneous or sedimentary?

.....



18. Show the different fault-slip components in the blank rectangles *(6 marks)*

1) .....

2) .....

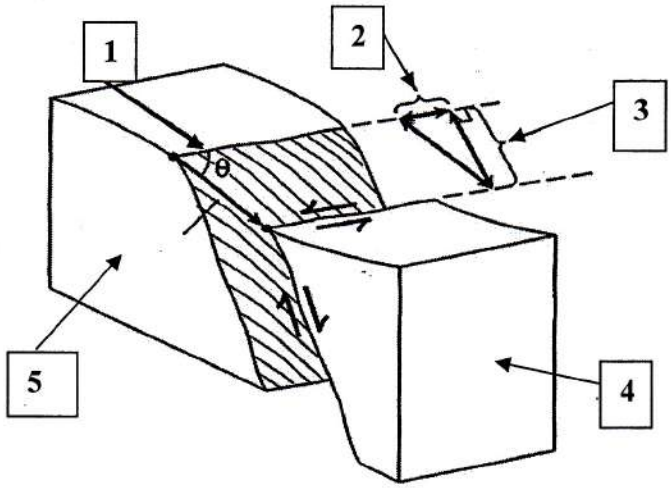
3) .....

4) .....

5) .....

6) What is the type of the fault?

.....



GOOD LUCK

Pro. Dr. Ahmed R. El Younsy ***4-6-2023***

Assiut University *Faculty of Science* *Geology Department*		*Second Semester Exam.* *2022 - 2023* *Time: 2 hours*

Subject: Sedimentary Environments and Sedimentary Basins (G335)

تنبيه هام : يتم طمس (تسويد) الإجابة المختارة من قبل الطالب باستخدام القلم الجاف فقط في ورقة الإجابة المرفقة مع الأسئلة

Answer the following questions: (50 Marks)

Q_1: Shade (T) for True or (F) for False sentences (one mark each): (20 Marks)

1. *Both the fluviatile and aeolian sediments are used for the same industrial purposes.*
2. *Pull-apart basins are characterized by continental and/or oceanic crust.*
3. *Delta forms only where rivers enter seas.*
4. *Fluviatile- related sediments display no vertical variation.*
5. *Miocene sediments of the Red Sea of Egypt are related to rifting mechanisms.*
6. *Geometry of sedimentary rocks doesn't help in environmental interpretation.*
7. *Most of the sedimentary basins of the world are belonging to onshore type.*
8. *Dolomites are related mainly to supratidal settings.*
9. *All the sedimentary basins of Egypt belonging to the same age.*
10. *Fertilizer materials of Egypt were accumulated in marine environment.*
11. *Nile Delta basin is mainly built up of siliciclastics.*
12. *Pre-depositional primary sedimentary structures and pre-depositional sedimentary basins have the same meaning.*
13. *Komombo and Beni Suef sedimentary basins have the same age.*
14. *Marine sediments were not recorded before the Paleozoic in Egypt.*
15. *Drainage area and climate are the main factors controlling alluvial fan size.*

16. *Paleocurrent can be defined from studying the deformational primary sedimentary structures.*
17. *Pelagic sediments are located within the marine environment shallower than the neritic one.*
18. *Coal deposits were accumulated in Egypt in transitional environment.*
19. *Trough cross–bedding is the main primary sedimentary structure characterizing the aeolian sediments.*
20. *Most of the evaporite deposits of Egypt occur in Kharga-Dakhla area.*

Q_2: Shade the correct answer A, B, C or D (<u>one mark each</u>): (30 Marks)

21. *Trace fossils are well represented in the_____ sediments of Egypt.*

Ⓐ *Cambrian* Ⓑ *Oligocene* Ⓒ *Miocene* Ⓓ *Pliocene*

22. *Amazon delta is_____ type.*

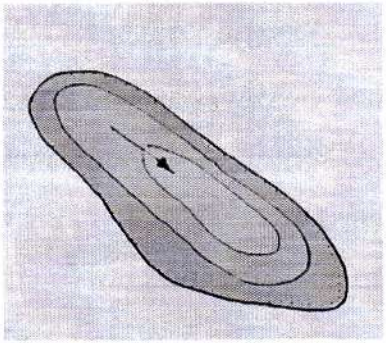
Ⓐ *River-dominated* Ⓑ *Wave-dominated*

Ⓒ *Tide -dominated* Ⓓ *Tide to wave-dominated*

23. *Mud cracks are commonly encountered in_____ sediments.*

Ⓐ *Supratidal* Ⓑ *Subtidal* Ⓒ *Intertidal* Ⓓ *Both A and B*

24. *The given figure represents_____ basin.*



Ⓐ *Sub circular* Ⓑ *Equidimensional*

Ⓒ *Embayment* Ⓓ *Structurally closed and elongated*

25. *Large fan-shaped deposits of fine-grained sediments that accumulated on the continental rise are called _____*

Ⓐ *Submarine fans* Ⓑ *Atolls* Ⓒ *Alluvial fans* Ⓓ *Spits*

26. *All the following factors controlling basin formation EXCEPT* _____

Ⓐ *Accommodation space* Ⓑ *Tectonic subsidence*

Ⓒ *Wind direction* Ⓓ *Eustatic sea level rise*

27. *The given figure represents* _____

Ⓐ *Symmetrical coarsening upward cycles*

Ⓑ *Asymmetrical coarsening upward cycles*

Ⓒ *Symmetrical fining upward cycles*

Ⓓ *Asymmetrical fining upward cycles*

28. *The age of Nile Delta sedimentary basins is of*_____

Ⓐ *Precambrian age* Ⓑ *Cretaceous age*

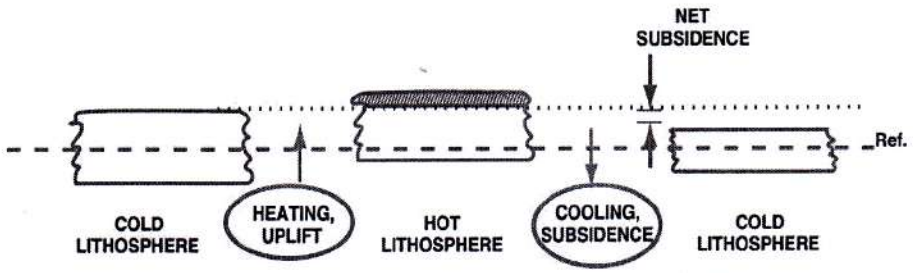
Ⓒ *Paleozoic age* Ⓓ *Oligocene and younger age*

29. *Fluvial sediments are of great economic importance for*_____

Ⓐ *Cement and ceramic industries* Ⓑ *Fertilizer industry*

Ⓒ *Textile industry* Ⓓ *Medical industries*

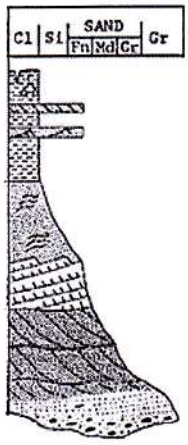
30. *Thermal way is one of the proposed mechanisms of sedimentary basin formation, which event marks the given figure?*



Ⓐ *Thermal way without erosion* Ⓑ *Thermal way with erosion*

Ⓒ *Thermal way with extensional thinning of the lithosphere* Ⓓ *Flexural way*

31. *The given figure represents*_____



Cl=clay, Si=Silt, Gr=Gravels

Ⓐ *Braided stream sediments*
Ⓑ *Meandering stream sediments*
Ⓒ *Anastomosing stream sediments*
Ⓓ *Both A and B*

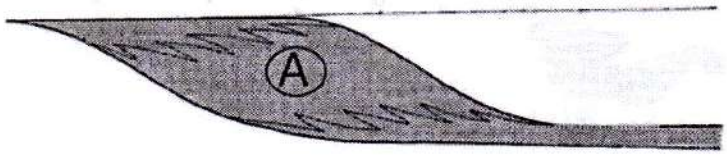
32. *The expected global warming in the future may lead to*_____

Ⓐ *Delta progradation*
Ⓑ *Delta retrogradation*
Ⓒ *Neither A nor B*
Ⓓ *Both A and B*

33. *The most major basin of Africa is*_____

Ⓐ *Junggar basin* Ⓑ *Nias basin* Ⓒ *Congo basin* Ⓓ *Canning basin*

34. *In the given figure of delta subenvironments, letter* Ⓐ *denotes*_____



Ⓐ *Delta plain* Ⓑ *Delta front* Ⓒ *Prodelta* Ⓓ *Both A and B*

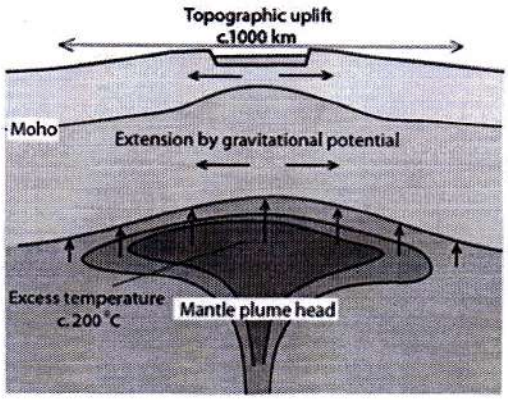
35. *River Nile delta is* _____ *type.*

Ⓐ *Wave-dominated*
Ⓑ *Fluvial- dominated*
Ⓒ *Tide-dominated*
Ⓓ *Mixed-energy*

36. *Foreland basin can be classified as*_____

Ⓐ *Divergent-related sedimentary basin*
Ⓑ *Collision-related sedimentary basin*
Ⓒ *Subduction-related sedimentary basin*
Ⓓ *Strike slip-related sedimentary basin*

37. *The given figure represents* _____



Ⓐ *Active rifting* Ⓑ *Passive rifting*

Ⓒ *Both A and B* Ⓓ *Neither A nor B*

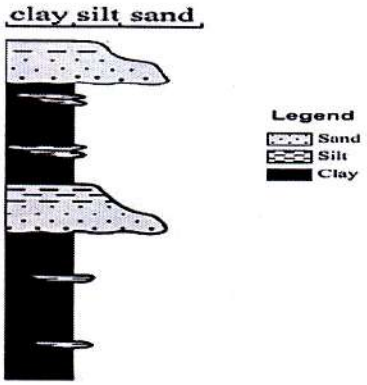
38. *Michigan sedimentary basins is of* _____ *age.*

Ⓐ *Triassic* Ⓑ *Ordovician* Ⓒ *Cambrian* Ⓓ *Silurian*

39. *Globally, loesses cover about* _____ *of the total land area.*

Ⓐ *6%* Ⓑ *16%* Ⓒ *26%* Ⓓ *36%*

40. *The given figure represents* _____



Ⓐ *Fluvial – related sediments* Ⓑ *Deltaic – related sediments*

Ⓒ *Aeolian – related sediments* Ⓓ *Tidal flat – related sediments*

41. *Cretaceous kaolin deposits are well represented in Egypt at* _____ *area.*

Ⓐ *Kharga-Dakhla* Ⓑ *Kalabsha*

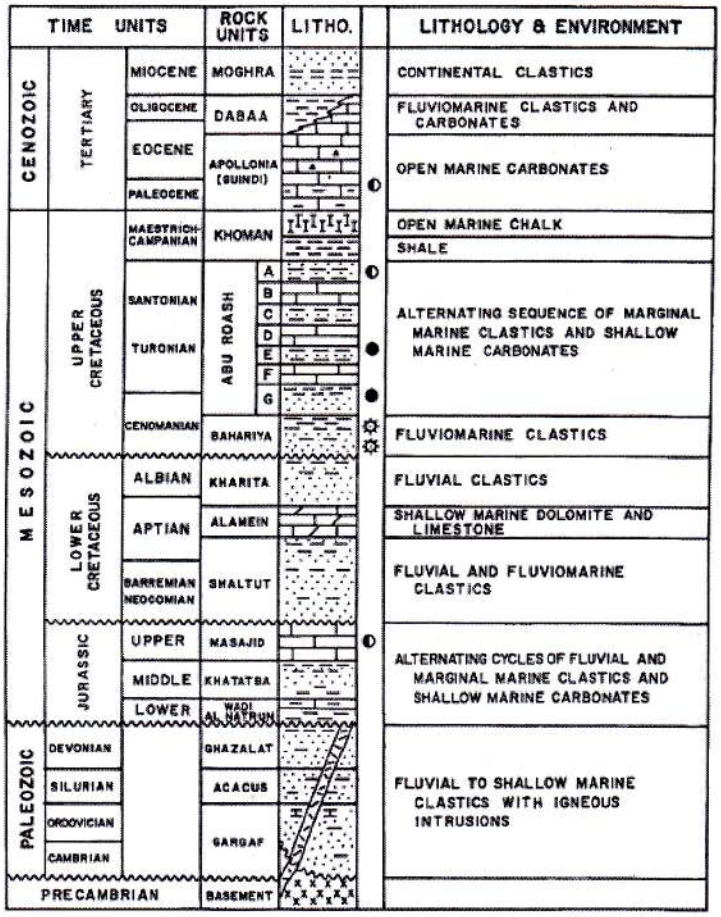
Ⓒ *Quseir-Safaga* Ⓓ *Alamein*

42. *Tidal flat sediments are characterized by* _____

Ⓐ *High angle planar cross – bedding* Ⓑ *Herringbone cross-bedding*

Ⓒ *Convolute bedding* Ⓓ *Slump – bedding*

43. *The given figure represents the stratigraphic section of* _____



Ⓐ *Abu El Gharadiq basin* Ⓑ *Nile delta basin*

Ⓒ *Komombo basin* Ⓓ *Beni Suef basin*

44. *Sorting is much better than roundness in the interpretation of*_____

Ⓐ *Distance of transportation* Ⓑ *Rate of sedimentation*

Ⓒ *Both A and B* Ⓓ *Neither A nor B*

45. *Which of the following environment supports the growth of mangrove swamp?*

Ⓐ *Marine* Ⓑ *Fluvial*

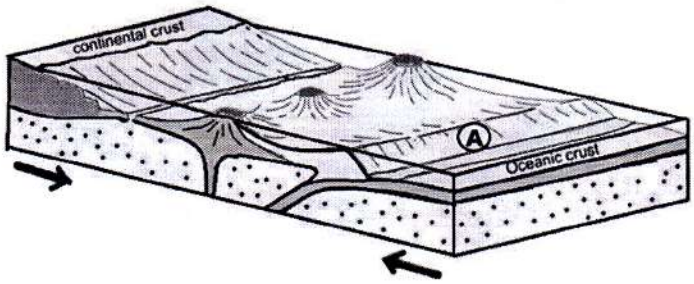
Ⓒ *Tidal flat* Ⓓ *Delta*

46. *Transgression is referred as*_____

Ⓐ *Fining upward sequence* Ⓑ *Coarsening upward sequence*

Ⓒ *Fining – coarsening upward sequence* Ⓓ *None of these*

47. *Letter* Ⓐ *in the given figure shows the location of* _____ *basin.*

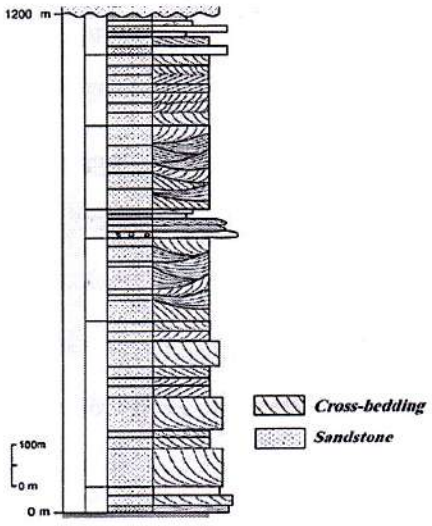


Ⓐ *Forearc* Ⓑ *Foreland* Ⓒ *Trench* Ⓓ *Backarc*

48. *The most common ancient continental sedimentary environment occurs in the sedimentary package of Egypt is represented by*_____ *sediments.*

Ⓐ *Aeolian* Ⓑ *Fluvial* Ⓒ *Lacustrine* Ⓓ *Deltaic*

49. *The given figure represents sequence of sediments accumulated by*_____ *processes.*



Ⓐ *Aeolian* Ⓑ *Marine* Ⓒ *Fluvial* Ⓓ *Deltaic*

50. *The thickest sedimentary basin occurs at* _____

Ⓐ *Germany* Ⓑ *Australia* Ⓒ *Canada* Ⓓ *Congo*

Good luck *Ezzat A. Ahmed*

جامعة أسيوط

كلية العلـــوم-قسم الجيولوجيا

امتحان طلاب المستوى الثالث (ساعات معتمدة)

مقرر (٣٤٠ ج) ميكانيكا الصخور وجيولوجيا تركيبية

مايو ٢٠٢٣ | الدرجة الكلية (٥٠ درجة) | الزمن : ٣ ساعات

Part1: Rock Mechanics (18 Marks)

A) Label the correct sentence with true (T) and the incorrect one with false (F) (10 Marks)	
1- Brittle substances are those that undergo a large plastic deformation before rupture.	( )
2- If the two ends of a rod are turned in opposite directions, the rod is subjected to tension.	( )
3- Shear stress can be either compressional or tensional.	( )
4-The finite strain is the sum of all of the incremental strains.	( )
5- The principal planes of stress have no components of normal stress acting on them.	( )
6- The strength of a rock decreases at depth because of the increase in confining pressure.	( )
7- When a force acts perpendicular (or "normal") to the surface of an object, it exerts a shear stress.	( )
8- Rocks are plastic and ductile near the earth's surface.	( )
9- The volumetric strain is defined as a change in length divided by the original length.	( )
10- The process of finding the resultant of two or more forces is called the composition of forces.	( )

B) What are the differences between the following items?
(Answer only two; 8 Marks)

1- Confining pressure & Directed pressure.

2- Plastic strain & Elastic strain.

3- Body forces & Surface forces.

Good Luck.....

Dr. Hassan Abbas

باقي الأسئلة في الصفحة التالية

PART II: STRUCTURAL GEOLOGY (35 marks)

ANSWER THE FOLLOWING TWO QUESTIONS:

Try to Illustrate your answers with suitable drawings when possible

وضح اجابتك بالرسم كلما أمكن

I. Choose the correct answer for the following statements, and then rewrite in your answer paper (6 MARKS)

1. ..... is a fault rock consisting of loose or loosely bound angular rock fragments often in a gouge matrix. *(1 mark)*

Mylonite - Fault breccias - Pseudotachylite

2. On a listric fault the hanging-wall block rotates around an axis that is .....
   a- parallel to the fault surface
   b- perpendicular to the fault surface
   c- oblique to the fault surface *(1 mark)*

3. .....is a term used to indicate the direction of movement and rotation that occurred during deformation

Vergence - Simple shear - Rake - Enveloping surface *(1 mark)*

4- In similar folds ..... *(1 mark)*
   a- maintain constant layer thickness across the folded surface.
   b-the layer thickness parallel to the axial surface remains constant.
   c- inter-limb angles are equal.

5- The angle between fold limbs in the profile plane is called the ..... *(1 mark)*

interlimb angle - true dip angle – vergence angle

6-In faulting, the horizontal component of dip separation is called..... *(1 mark)*

Throw - Heave - dip slip

II. Salt diapirs are considered one of the main structural styles of high geologic importance; explain their mode of formation , the associated geologic structures and their economic importance. *(9marks)*

ANSWER ONLY FOUR OF THE FOLLOWING QUESTIONS:

III. Define and illustrate by drawings:

Overturned folds – Monoclines - Listric faults -

Strike Oblique slip normal fault - Pull-apart basin *(5 marks)*

IV- Write short notes on field criteria of faults . (5 marks)

V. Using suitable diagrams, explain the Anderson's theory of stress distribution and faulting. (5 marks)

VI. Write on the structural make up of the Gulf of Suez and the main characteristics of different basins of the Gulf. (5 marks)

VII. Explain how folds may develop as an indirect result of shearing stress. (5 marks)

GOOD LUCK

Prof. Dr. Moustafa M. Youssef

Assiut University

Faculty of Science

Geology Department

Date: May 2023

Time allowed: 2 Hours

Total marks: 50 Marks

Practical Examination

Special Course 305G (Ophiolite)

Answer only <u>four</u> questions from the following <u>starting with the first one:</u>

1. **Explain the sequence of events associating an arc-continent collision with giving examples. (14 Marks)**

2. **Write briefly on the lithologies of the ideal sequence of ophiolites. (12 Marks)**

3. **Summarize briefly the main tectonic structures associating the region of subduction zone. (12 Marks)**

4. **Compare between the oceanic crust and the continental crust. (12 Marks)**

5. **Write short notes on the mantle transition zone. (12 Marks)**

Good Luck

Prof. Dr. Ali A. Khudeir

Geology Department **Faculty of Science** **Assiut University**		**Time: ٢ Hours** **Mai ٢٠٢٣** **Second term**

Final Examination

Sedimentary rocks and sedimentary environments ((٣٢٧G)

Students: ٣rd level of Geology

Answer the following questions (٥٠ marks)

١. Sedimentary rocks are..... (٢ marks).

A. Rocks resulting from the consolidation of loose sediment that has been derived from previously existing rocks and accumulated in layers.

B. Rocks formed by the precipitation of minerals from solution by either organic or inorganic processes.

C. None of the above.

٢. The major difference between breccia and conglomerate is.....(٢ marks).

A. Grain size and composition.

B. Grain rounding.

C. All of these are differences between breccia and conglomerate.

٣. A sandstone that contains >٢٥٪ feldspar is termed a..... (٢ marks).

A. Quartz arenite.

B. Graywacke.

C. Arkose.

٤. Having uniform grain size, choose the correct statement...(٢ marks).

A. Cubic packing has higher porosity than rhombohedral packing.

B. Rhombohedral packing has higher porosity than cubic packing.

C. Packing of grains has no effect on porosity.

٥. Sorting is a measure of the.....(٢ marks).

A. Range of grain size present in a sediment.

B. Range of mineral composition present in a sediment.

C. Abundance of coarse fragments in a breccia.

٦. Which of the following lists is written in order of decreasing particle size.....(٢ marks).

A. Sandstone, conglomerate, siltstone.
B. Conglomerate, sandstone, siltstone.
C. Siltstone, sandstone, conglomerate.

٧. Halite and gypsum are both evaporite minerals. A geologist finds a layer of gypsum in a rock outcrop. What can the geologist infer from the existence of this layer.....(٢ marks).?

A. The area was once volcanically active.
B. The area was once covered in salt water.
C. The area was once buried deep under layers of other rocks.

٨. Boulders and gravel tend to be deposited in what part of an alluvial fan.....(٢ marks).?

A. The apex.
B. The mid-fan.
C. The tail.

٩. In which environment does wind blown transport of sediment dominate.....(٢ marks).?

A. Humid and tropical environments.
B. Frozen environments.
C. Arid and semi-arid environments.

١٠. Calcareous oozes and siliceous oozes are biological sediments that occur where.....(٢ marks).?

A. Braided river channels.
B. Deep sea environments.
C. Rain forests.

١١. Why is the Mississippi delta so large.....(٢ marks).?

A. Because the Mississippi river transports a huge amount of sediment.
B. Because the tides and waves in the gulf of Mexico are not very strong.
C. All of these.

١٢. Point bars are deposited.....(٢ marks).

A. On the inside of a meander bend.
B. On the outside of a meander bend.
C. By turbidity currents.

١٣. The primary difference between a delta and an alluvial fan is that.....(٢ marks).

A. Alluvial fans are erosional features, whereas deltas are depositional features.

B. Alluvial fans result from deposition into inland lakes, while deltas result from deposition into the ocean.

C. Alluvial fans are formed on low-land plains, while deltas are formed in a standing body of water.

١٤. Transport of particles by water, wind or flowing glaciers has the potential to cause changes to their shape over time (٢ marks).

A. True B. False

١٥. Eolian (windblown) sands commonly have a higher sphericity than water transported sand (٢ marks).

A. True B. False

١٦. The more densely packed the particles the lower the porosity (٢ marks).

A. True B. False

١٧. Ortho-conglomerate is a conglomerate in which all clasts are not in contact with other clasts (i.e., the clasts do not support each other) (٢ marks).

A. True B. False

١٨. Quartz is the most stable of the common mineral; it resists chemcial weathering and is the most common mineral in most sedimentary rocks (٢ marks).

A. True B. False

١٩. Boulder conglomerates suggest deposition by strong winds in a desert (٢ marks).

A. True B. False

٢٠. Mud cracks in a shale or mudstone indicate that the mud or clay was deposited in deep waters of an offshore marine environment (٢ marks).

A. True B. False

٢١. A meandering river system has a unidirectional current flow; marine tidal channels have bidirectional but aeolian environment has polydirectional current flow (٢ marks).

A. True B. False

٢٢. It appears that depositional sedimentary environments are predominantly terrestrial (٢ marks).

A. True B. False

٢٣. Alluvial environment is an example of a shoreline/transitional environment (٢ marks).

A. True B. False

٢٤. Larger grain sizes like gravels and sands tend to show a calm energy environment (٢ marks).

A. True B. False

٢٥. The color of the sedimentary rock indicates whether that rock was formed on land or in water (٢ marks).

A. True. B. False.

****

Good Luck ***Prof. Dr. Abdalla El Ayyat***